



ACE-ing

Constructed Responses

by **Debra Bareño**
& **Holly Young**





A

**Answer the Question
Correctly!**

C

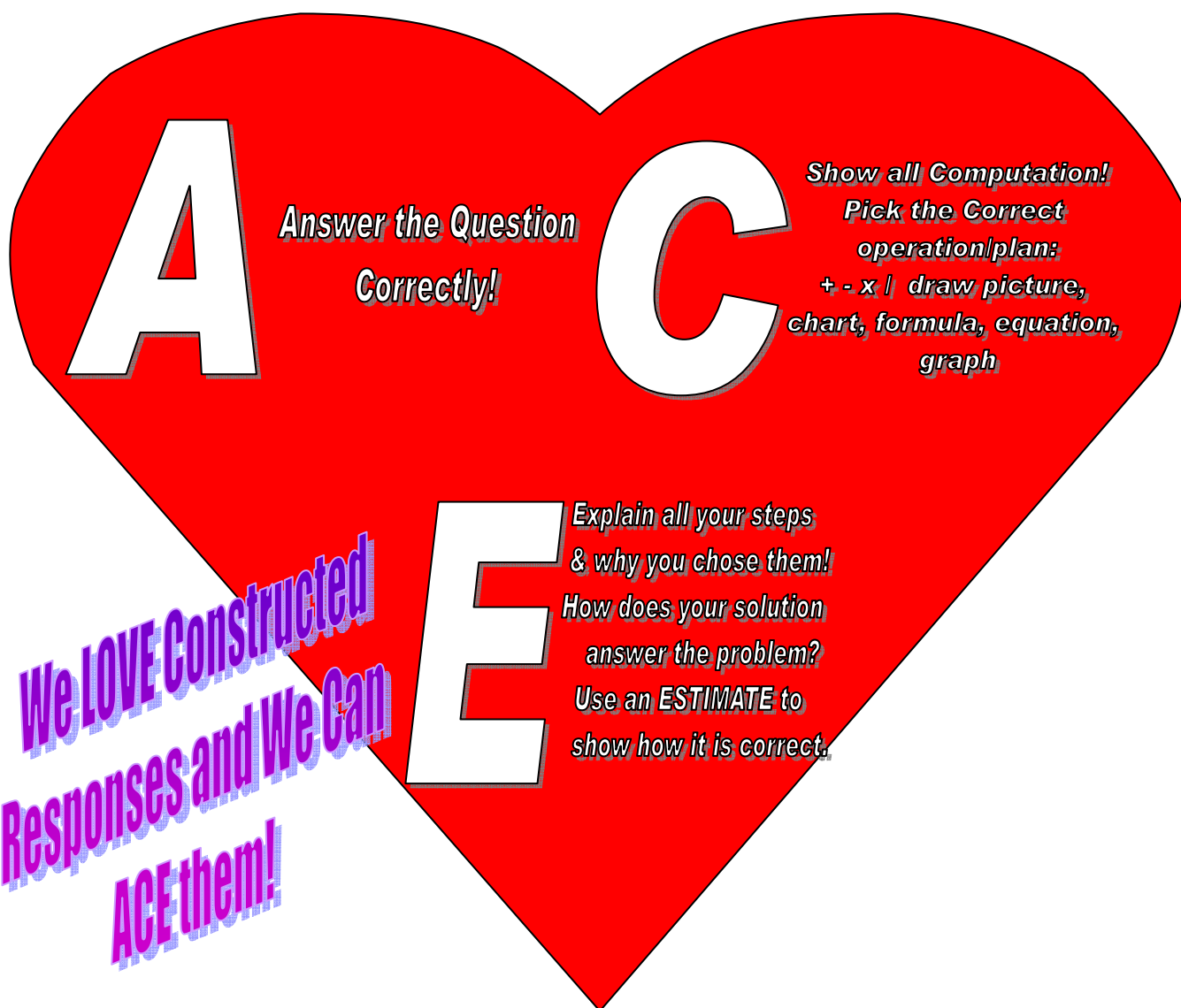
**Show all Computation!
Pick the Correct
operation/plan:
+ - x | draw picture,
chart, formula, equation,
graph**

E

**Explain all your steps
& why you chose them!
How does your solution
answer the problem?
Use an **ESTIMATE** to
show how it is correct.**

**We LOVE Constructed
Responses and We Can
ACE them!**

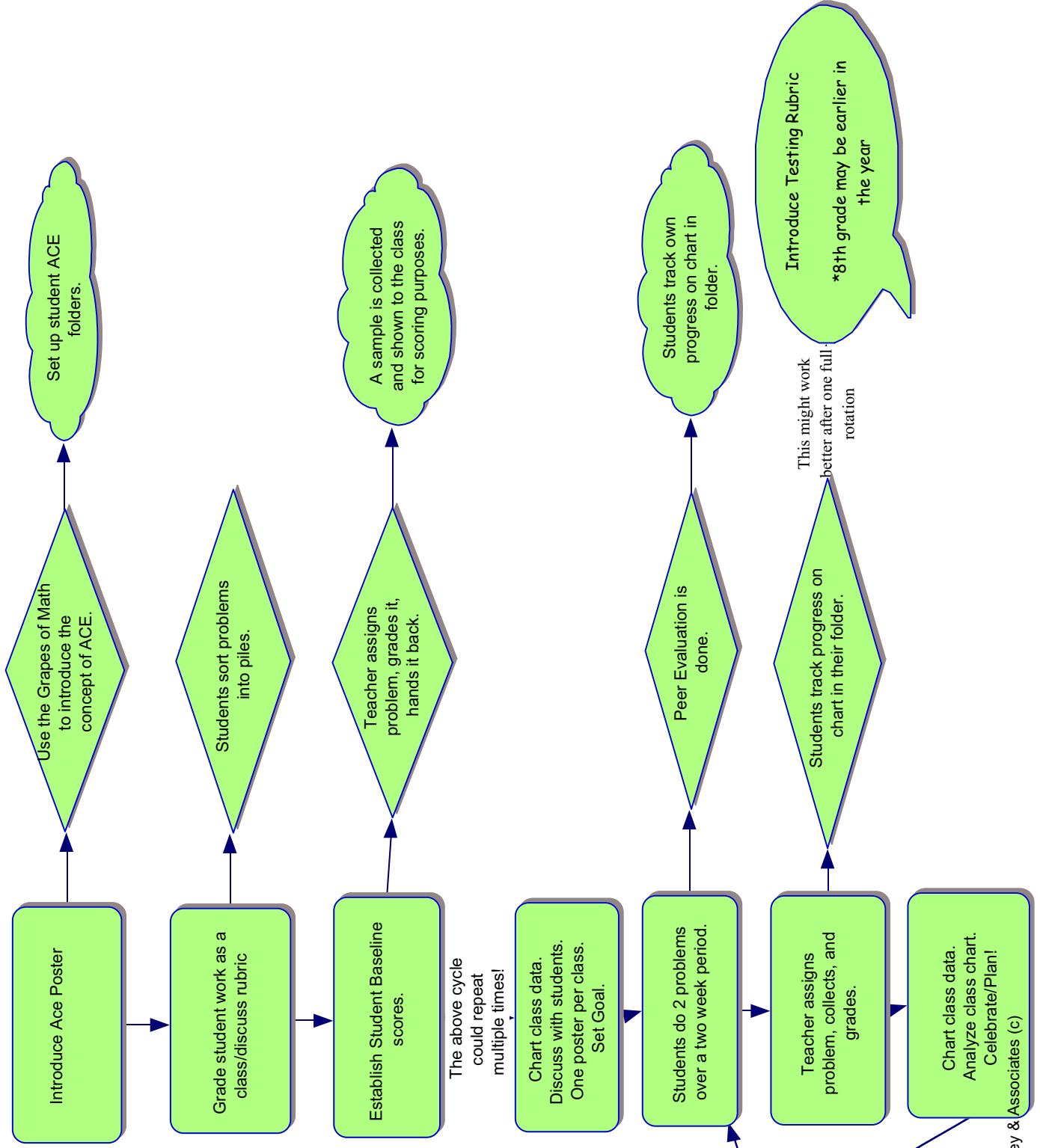




Problem: Before you have too big a clan, It's good to have a housing plan. Instead of building one big nest, lots of small ones may be best! How many eggs are in this batch? Count them quick before they hatch. Here's a hint you can't ignore: Adding's fast with groups of four!					
A	Answer correctly		C	Choose & Compute	
E	Explain all the steps				



Math Constructed Response Implementation



Peer Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

Author must have both!!!

All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

Which ones did the author have in his/her answer?

Circle any that he/she forgot to do.

Estimate not always required.

In the explanation details are given to make clear why that *PARTICULAR* plan was chosen.

The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Total of 3 points.

Peer Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

In the explanation details are given to make clear why that *PARTICULAR* plan was chosen.

The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Peer Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Peer Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Peer Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Teacher Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Teacher Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

All steps in any type of computation are shown.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Teacher Response to Constructed Response:

My name _____

Writer's name _____

Yes No

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☐ ☐ **C** – The correct operation is shown or the plan is clearly shown.

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The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Teacher Response to Constructed Response:

My name _____

Writer's name _____

Yes No

☐ ☐ **A** – The question is answered correctly.

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All steps in any type of computation are shown.

☐ ☐ **E** – Every step is explained.

In the explanation details are given to make clear why that *PARTICULAR* plan was chosen.

The person went back and answered all parts of the question.

If possible, an estimate is shown in order to justify the answer.

Total points for each "Yes:" _____

Charting My Progress!

Name _____

Assignment	Date	A	C	E	My Score	Peer Evaluation Score	Teacher Score	
(Teacher's turn to collect & grade)								
When I look at the Response Check Sheet, I realize that I need to get better at...								
(Teacher's turn to collect & grade)								
When I look at the Response Check Sheet, I realize that I need to get better at...								



Charting My Progress!

Name _____

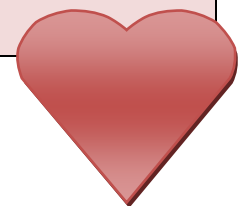
Assignment	Date	A	C	E	My Score	Peer Evaluation Score	Teacher Score
Simple Interest #24	1/22/08	X	X		2		
		X				1-Austin	
Formulas #10	1/29/08	X	X		2		
		X				1-Sam	
Proportions #3 (Teacher's turn to collect & grade)	2/04/08	X	X		2	1	
		X					
When I look at the Response Check Sheet, I realize that I need to get better at...	C & E. I thought I showed my plan, but everyone says that I am not explaining it step by step. I need to label it better.						
(Teacher's turn to collect & grade)							
When I look at the Response Check Sheet, I realize that I need to get better at...							



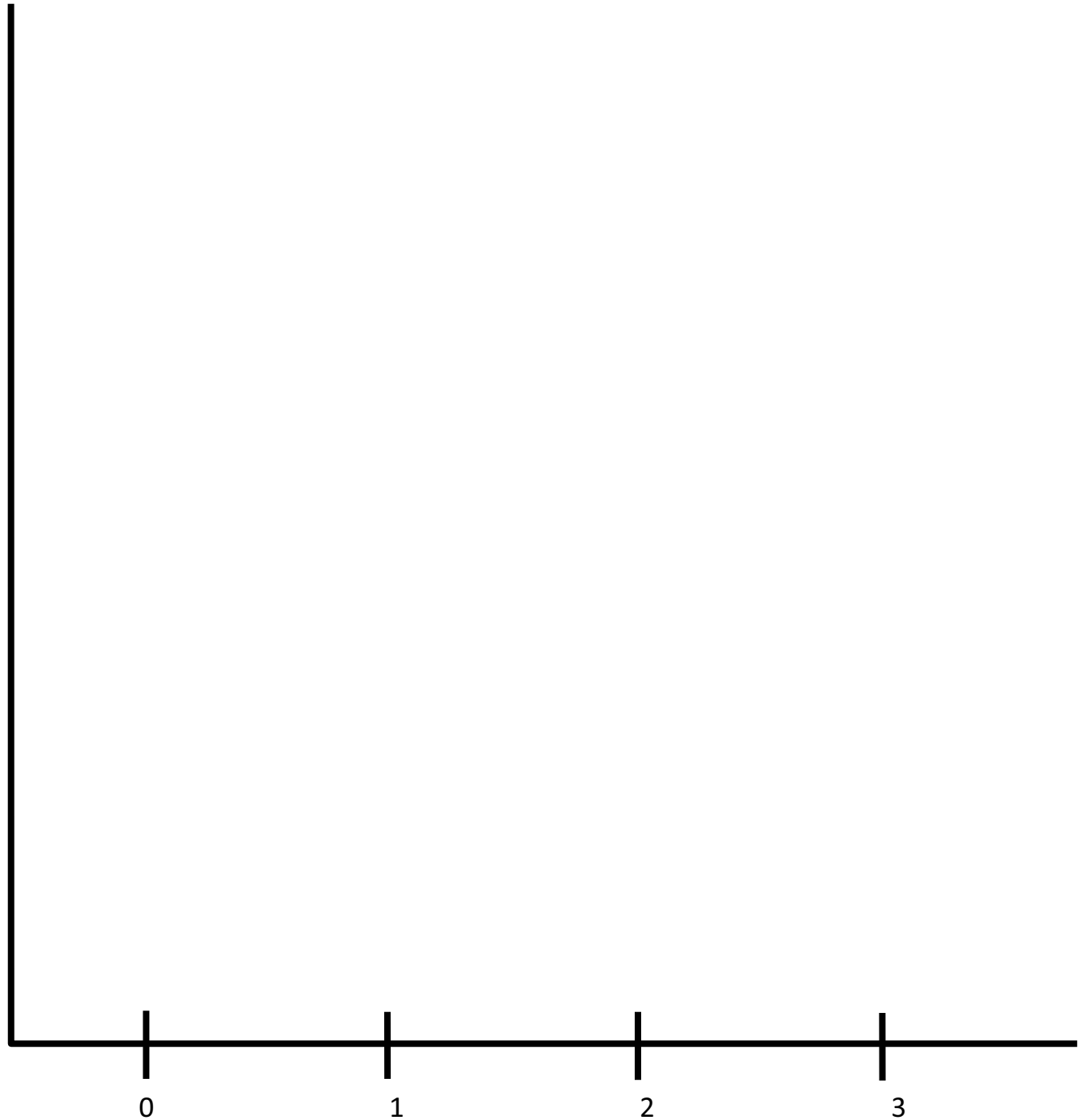


Name _____

Assignment	Date	A	C	E	My Score	Peer Evaluation Score	Peer Evaluation Score	Teacher Score
Collect and Chart								
When I look at the Response Check Sheet, I realize that I need to get better at...								
Collect and Chart								
When I look at the Response Check Sheet, I realize that I need to get better at...								



Charting our progress!





Name: _____

WRITTEN ANSWER/MATHEMATICS

Question:

Name: _____

Date: _____

Period: _____

A

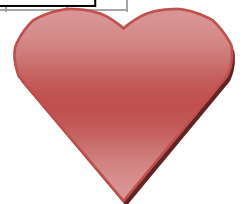
Reminder: You will need to write your answer here.

C

Reminder: Pick the correct operation or plan (+ - X). Calculate the answer by working it out or by drawing a picture.

E

Reminder: Explain your thought process and how you got the solution to the problem.





Name: _____

WRITTEN ANSWER/MATHEMATICS

Question:

Name:

Date:

Period:

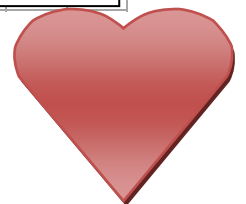
A

C

E

Reminder: Pick the correct operation or plan (+ - X). Calculate the answer by working it out or by drawing a picture.

Reminder: Explain your thought process and how you got the solution to the problem.





Name: _____

WRITTEN ANSWER/MATHEMATICS

Question:

Name:

Date:

Period:

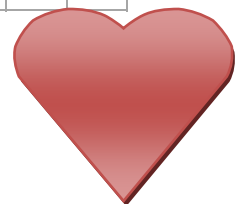
A

C

E

Reminder:

Explain your
thought process
and how you got
the solution to
the problem.





Name:

WRITTEN ANSWER/MATHEMATICS

Question:

Name:

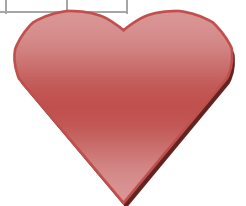
Date:

Period:

A

C

E



Name:

WRITTEN ANSWER/MATHEMATICS

QUESTION:

NAME:





Your answer will be scored primarily on the following rubric.
 (Teacher note: The following checklist is general & for student use.)

8th Grade Math Rubric

Score	Expectations
Full Credit 3	<ul style="list-style-type: none"> Your response addresses all parts of the question clearly and correctly. You use and label the proper math terms in your answer. Your response shows all the steps you took to solve the problem.
Partial Credit 2	<ul style="list-style-type: none"> Your response addresses most parts of the question correctly. Your response does not show all of your work or does not completely explain the steps you took to solve the problem.
Minimal Credit 1	<ul style="list-style-type: none"> Your response addresses only one part of the question correctly and explains the steps you took to solve that one part. In answering the remaining parts of the question, your response is incomplete or incorrect. Your response does not show all of your work or does not explain all the steps you took to solve the problem.
No Credit 0	<ul style="list-style-type: none"> Your response is incorrect. You did not attempt the problem.

"KIDSPEAK"

Which words or phrases match ACE?

A

Answer: Write your answer.

What words/phrases do you not understand:

C

Compute: Pick the correct operation or plan (+ - X). Calculate the answer by working it out or by drawing a picture.

Teacher explanation:

E

Explain: Explain your thought process and how you got the solution to the problem.

3rd Grade Constructed Response Problems

3rd Grade	1st marking period	Mathematics Assessment Sampler 3-5	
1.3.7	Numbers, Number Sense, and Computation: Add and subtract two- and three-digit numbers with and without regrouping. Add and subtract decimals using money as a model.	pg 35 #42	pg 36 #44
1.3.8	Numbers, Number Sense, and Computation: Generate and solve two-step addition and subtraction problems and one-step multiplication problems based on practical situations. Model addition, subtraction, multiplication, and division in a variety of ways. Use mathematical vocabulary and symbols to describe multiplication and division.	pg 22 #26	pg 23 #27
1.3.3	Numbers, Number Sense, and Computation: Read, write, compare, and order numbers from 0 – 9,999. Read and write numbers words to 100.	pg 5 #2	
2.3.1	Patterns, Functions, and Algebra: Recognize, describe, and create patterns using objects and numbers found in tables, number charts, and charts. Record results of patterns created using manipulatives, pictures, and numeric representations and describe how they are extended.	pg 50 #8	pg 53 #12
2.3.2	Patterns, Functions, and Algebra: Model, explain, and solve open number sentences involving addition, subtraction, and multiplication facts. Use variables and open sentences to express relationships.	pg 56 #16	Pg 57 #17
3.3.6	Measurement: Tell time to the nearest minute, using analog and digital clocks. Use elapsed time in half-hour increments, beginning on the hour or half-hour, to determine start, end, and elapsed time. Recognize that there are 60 minutes in 1 hour.		

3rd Grade Constructed Response Problems

3rd Grade	2nd marking period	Mathematics Assessment Sampler 3-5	
1.3.5	Numbers, Number Sense, and Computation: Immediately recall and use addition and subtraction facts. Immediately recall multiplication facts (products to 81).	pg 23 #27	
1.3.7	Numbers, Number Sense, and Computation: Add and subtract two- and three-digit numbers with and without regrouping. Add and subtract decimals using money as a model.	pg 35 #42	pg 36 #44
1.3.3	Numbers, Number Sense, and Computation: Read, write, compare, and order numbers from 0 – 9,999. Read and write number words to 100.	pg 5 #2	
1.3.1	Numbers, Number Sense, and Computation: Identify, use, and model place value positions of 1"s, 10"s, 100"s, and 1,000"s. Identify the value of a given digit in the 1"s, 10"s, 100"s, and 1,000"s place.	pg 4 #1	pg 6 #4
2.3.3	Patterns, Functions, and Algebra: Complete number sentences with appropriate words and symbols (+, -, >, <, =).	pg 28 #33	
3.3.4	Measurement: Determine possible combinations of coins and bills to equal given amounts. Read, write, and use money notation. Recognize equivalent relationships between and among bills and coins.		
4.3.1	Spatial Relationships and Geometry: Describe, sketch, compare, and contrast plane geometric figures.	pg 76 #1	pg 76 #2

3rd Grade Constructed Response Problems

3rd Grade	3rd marking period	Mathematics Assessment Sampler 3-5	
1.3.4	Numbers, Number Sense, and Computation: Model and explain multiplication and division as skip counting patterns. Model and explain multiplication and division as repeated addition or subtraction.	pg 20 #22	pg 23 #27
1.3.2	Numbers, Number Sense, and Computation: Identify and model the unit fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{6}$, and $\frac{1}{8}$ as equal parts of a whole or sets of objects. Read and write unit fractions with numbers and words.	pg 7 #5	pg 7 #6
2.3.1	Patterns, Functions, and Algebra: Recognize, describe, and create patterns using objects and numbers found in tables, number charts, and charts. Record results of patterns created using manipulatives, pictures, and numeric representations and describe how they are extended.	pg 50 #8	pg 53 #12
4.3.2	Spatial Relationships and Geometry: Demonstrate and describe the transformational motion of geometric figures (translation/slide, reflection/flip, and rotation/turn).	pg 101 #18	pg 109 #24
4.3.3	Spatial Relationships and Geometry: Create two-dimensional designs that contain a line of symmetry.	pg 112 #26	
5.3.1	Data Analysis: Pose questions that can be used to guide data collection, organization, and representation. Use graphical representations, including number lines, frequency tables, and pictographs to represent data.	pg 155 #3	

3rd Grade Constructed Response Problems

3rd Grade	4th marking period	Mathematics Assessment Sampler 3-5	
1.3.7	Numbers, Number Sense, and Computation: Add and subtract two- and three- digit numbers with and without regrouping. Add and subtract decimals using money as a model.	pg 35 #42	pg 36 #44
3.3.2	Measurement: Select and use appropriate units of measure. Measure to a required degree of accuracy (to the nearest $\frac{1}{2}$ unit).	pg 118 #1	pg 120 #4
3.3.1	Measurement: Compare, order, and describe objects by various measurable attributes for area and volume/capacity.	pg 137 #24	pg 141 #29
4.3.4	Spatial Relationships and Geometry: Compare, contrast, sketch, model, and build two-and three-dimensional geometric figures and objects.	pg 76 #2	pg 78 #3
5.3.5	Data Analysis: Use informal concepts of probability (certain, likely, unlikely, impossible) to make predictions about future events.		
5.3.1	Data Analysis: Pose questions that can be used to guide collection, organization, and representation. Use graphical representations, including number lines, frequency tables, and pictographs to represent data.	pg 155 #3	

7th Grade Constructed Response Problems

7th grade	1st marking period				
1.7.8	Identify and apply the distributive, commutative, and associative properties of rational numbers to solve problems.	3-5 book pg.26 #31			
2.7.1	Use and create tables, charts, and graphs to extend a pattern in order to describe a linear rule, including integer values.	3-5 book pg. 71 #33			
1.7.7	Calculate with integers and other rational numbers to solve mathematical and practical situations. Use order of operations to evaluate expressions and solve one-step equations (containing rational numbers).	pg.18 #13	3-5 book pg. 19 #20		
2.7.2	Evaluate formulas and algebraic expressions for given integer values. Solve and graphically represent equations and inequalities in one variable with integer solutions.				
5.7.5	Find the theoretical probability of an event using different counting methods including sample spaces and compare that probability with experimental results. Represent the probability of an event as a number between 0 and 1.	pg. 218 #20			
2.7.4	Generate and graph a set of ordered pairs to represent a linear equation.	3-5 book pg. 67 #28 tweak the question to include pts & graph			
4.7.7	Model the Pythagorean Theorem and solve for the hypotenuse.	pg. 160 #14			
5.7.1	Formulate questions that guide the collection of data. Organize, display, and read data using the appropriate graphical representations (with and without technology).	pg. 190 #2			
7th grade	2nd marking period				
1.7.5	Identify absolute value of integers				
1.7.3	Compare and order a combination of rational numbers, including fractions, decimals, percents, and integers in mathematical and practical situations.	pg. 9 #5	3-5 book pg. 7 #5		
1.7.6	Generate a reasonable estimate for a computation using a variety of methods. Select and round to the appropriate significant digit.	3-5 book pg. 31 #36	3-5 book pg.30 #35		
1.7.2	Translate among fractions, decimals, and percents including fractional percents.	3-5 book pg. 11 #11			
2.7.3	Simplify algebraic expressions by combining like terms.				

7th Grade Constructed Response Problems

4.7.2	Make scale drawings using ratios and proportions.	3-5 book pg. 121 #5	3-5 book pg. 120 #4	pg. 185 #28
4.7.3	Demonstrate translation, reflection, and rotation using coordinate geometry and models. Describe the location of the original figure and its transformation on a coordinate plane.	3-5 book pg. 104 #21 has student work		
4.7.4	Make a model of a three dimensional figure from a two-dimensional drawing. Make a two-dimensional drawing of a three-dimensional figure.	3-5 book pg. 115 #29	pg. 136 #24	
4.7.8	Construct and identify congruent angles, parallel lines, and perpendicular lines.	pg. 112 #3		
3.7.2	Given a measurement, identify the greatest possible error.			
7th grade	3rd marking period			
3.7.4	Calculate simple interest in monetary problems	pg. 28 #24		
3.7.3	Select, model, and apply formulas to find the volume and surface area of solid figures.	pg. 154 #10	pg. 168 #19	3-5 book pg. 147 #38
3.7.5	Write and apply proportions to solve mathematical and practical problems involving measurement and monetary conversions	pg. 144 #3	pg. 146 #5	
3.7.6	Use elapsed time to solve practical problems.	pg. 17 #12		
1.7.1	Identify and use place value in mathematical and practical situations. Write, identify, and use powers of 10 from 10^3 through 10^6	pg. 16 #10 tweak second number		
4.7.1	Identify, classify, compare and draw regular and irregular polygons. Find and verify the sum of the measures of interior angles of triangles and quadrilaterals.	pg.111 #2	pg. 113 #5	pg. 115 #7
4.7.5	Determine slope of a line, midpoint of a segment, and the horizontal and vertical distance between two points using coordinate geometry.	pg. 106 #22	pg. 103 #21	3-5 book pg.100 #17
4.7.6	Describe the geometric relationships of parallel lines, perpendicular lines, triangles, quadrilaterals and bisectors.	pg.112 #4	3-5 book, pg. 83 #5 has student work	
5.7.6	Interpolate and extrapolate from data to make predictions for a given set of data.	pg. 95 #19	3-5 book pg. 70 #32	

7th Grade Constructed Response Problems

7th Grade	4th marking period				
1.7.7	Calculate with integers and other rational numbers to solve math and practical situations (percents). Use order of operations to evaluate expressions and solve one-step equations (containing rational numbers).	pg. 7 #3	pg. 6 #2	Pg. 10 #6 has student work	
3.7.1	Estimate and compare corresponding units of measure for area and volume/capacity between customary and metric systems.	3-5 book pg. 128 #12		pg. 83 #5 & student work	
2.7.5	Identify linear equations and inequalities. Model and solve equations using concrete and visual representations.	pg. 52 #6	pg. 53 #7		
5.7.3	Analyze the effect a change of scale will have on statistical charts and graphs.				
5.7.1	Formulate questions that guide the collection of data. Organize, display, and read data using the appropriate graphical representations.	3-5 book pg. 177 #19		3-5 book pg. 157 #4 student work	
5.7.2	Interpret graphical representations of data to describe patterns, trends, and data distribution.	pg. 206 #12 has student work		pg. 210 #14 has student work	pg.213 #15
5.7.4	Find the number of permutations possible for an event in mathematical and practical situations.	3-5 book pg. 182 #24 has student work			

8th Grade Constructed Response Problems

8th grade	1st marking period			
3.8.4	Calculate percents in monetary problems.	pg.14 #8		
1.8.2	Translate among fractions, decimals, and percents, including percents greater than 100 and percents less than 1.	3-5 book pg.17 #18	pg.7 #3	pg.10 #6 has student work
1.8.1	Represent numbers using scientific notation in mathematical and practical situations.	pg.15 #9	pg. 16 #10	
2.8.3	Add and subtract binomials.			
3.8.1	Estimate and convert units of measure for mass and capacity within the same measurement system (customary and metric).	3-5 book pg.131 #15		
5.8.2	Select and apply appropriate measures of data distribution, using interquartile range and central tendency.	3-5 book pg.166 #8	3-5 book pg.169 #11	3-5 book pg.173 #15
5.8.6	Formulate reasonable inferences and predictions through interpolation and extrapolation of data to solve practical problems.	pg. 76 #16 has student work	pg. 95 #19	
8th grade	2nd marking period			
1.8.5	Identify perfect squares to 225 and their corresponding square roots	3-5 book pg. 137 #24		
1.8.6	Use estimation strategies to determine the reasonableness of an answer in mathematical and practical situations.	pg. 10 #6		
2.8.4	Identify, model, describe, and evaluate functions (with and without technology). Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations (with and without technology).	pg. 58 #9 has student work		
2.8.6	Describe how changes in the value of one variable affect the values of the remaining variables in a relation.	pg. 172 #21		
3.8.5	Apply ratios and proportions to calculate rates and solve mathematical and practical problems using indirect measure.	pg. 174 #23	pg. 154 #9	
4.8.5	Calculate slope, midpoint, and distance using equations and formulas (with and without technology). Determine the x- and y-intercepts of a line.	pg. 98 #20		

8th Grade Constructed Response Problems

5.8.1	Formulate questions and design a study that guides the collection of data. Organize, display, and read data including box and whisker plots (with and without technology).	pg. 204 #11	pg. 207 #12 has student work	
3.8.2	Determine an understanding of precision, error, and tolerance when using appropriate measuring tools.	pg. 133 #18		
4.8.1	Find and use the sum of the measure of interior angles of polygons.			
8th grade	3rd marking period			
1.8.7	Calculate with real numbers to solve mathematical and practical situations. Use order of operations to solve equations in the real number system.	pg.22 #19 has student work		
1.8.3	Compare and order real numbers, including powers of whole numbers in mathematical and practical situations.	pg.10 #6 has student work		
2.8.1	Find the missing term in a numerical sequence or a pictorial representation of a sequence.	pg.46 #1		
2.8.5	Solve linear equations and represent the solution graphically. Solve inequalities and represent the solution on a number line.	pg.52 #6		
4.8.2	Apply the properties of equality and proportionality to congruent or similar shapes.	pg. 114 #6, pg.138 #26		
4.8.7	Verify and explain the Pythagorean Theorem using a variety of methods. Determine the measure of the missing side of a right triangle.	pg.119 #10 has student work		
5.8.4	Find the number of combinations possible in mathematical and practical situations. Distinguish between permutations and combinations.			
5.8.5	Differentiate between the probability of an event and the odds of an event.			
8th grade	4th marking period			
1.8.8	Identify and apply the identity property, inverse property, and the absolute value of real numbers to solve problems.			

8th Grade Constructed Response Problems

2.8.4	Identify, model, describe, and evaluate functions (with and without technology). Translate among verbal descriptions, graphic, tabular, and algebraic representations of mathematical situations with and without technology.	pg.55 #8 has student work, pg. 58 #9		
2.8.2	Evaluate formulas and algebraic expressions using rational numbers with and w/o tech. Solve and graphically represent equations and inequalities in one variable, including absolute value.	pg.51 #5		
4.8.3	Demonstrate dilation using coordinate geometry and models. Describe the relationship between an original figure and its transformation or dilation.			
3.8.3	Identify how changes in a dimension of a figure effect changes in its perimeter, area, and volume.	pg. 173 #22, pg.174 #23		
4.8.6	Form generalizations and validate conclusions about geometric figures and their properties.	pg. 110 #1		
5.8.3	Evaluate statistical arguments that are based on data anlysis for accuracy and validity.	3-5 book pg.176 #18		

Constructed Response Books Ordering Information

These books can only be ordered from NCTM directly. You can contact them at (800) 235-7566 or go online at www.nctm.org. If anyone in your department is a member, have them use their member number to get a discount on the books. They run about \$44 per book.

Mathematics Assessment Sampler Grades 3-5

Mathematics Assessment Sampler Grades 6-8

The Grapes of Math by Greg Tang ISBN: 978-0-439-59840-8 by Scholastic Press.

The Paper Bag Princess by Robert Munsch ISBN: 978-0-920236-16-1 by Annick Press.

The Salamander Room by Anne Mazer ISBN: 0-679-86187-4 by Alfred A Knopf publishing.